**Experimental characterization of filament wound glass/epoxy and carbon/epoxy composite materials**


ABSTRACT

Composites have been used extensively in application such as pipes and pressure vessels. Therefore there is a need for further studies on the properties of these materials. This paper presents the results from a series of tensile tests on the mechanical properties of composite materials. Specimens cut from pipes made from composite materials were tested under internal pressure loadings have been tested by using a series of ASTM Standards test methods for mechanical properties. Based on the results obtained, the longitudinal E11, transverse E22 and shear modulus G12 of 101.2 GPa, 5.718 GPa, 4.346 GPa and 36.6, 5.4 GPa, 4.085 GPa for carbon and glass fiber/epoxy composites, respectively, while the ultimate longitudinal XL, transverse XT and shear tensile Ű0 strengths of 1475.4 MPa, 20 MPa, 36 MPa and 618.9 MPa, 14 MPa, 28 MPa for carbon and glass fiber/epoxy composites, respectively. The results from this series of tests have been presented and compared with results from analytical equations. Good agreement was achieved between the experimental results and analytical results.



**Keyword:** Characterization; Filament wound pipes; Glass; Carbon; Epoxy; Composite; Mechanical properties; Tensile test